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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/705,899

11/13/2003

Joun Ho Lee

8733.275.20-US

6109

30827 7590 11/26/2007  
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EXAMINER

NGUYEN, HOAN C

ART UNIT

PAPER NUMBER

2871

MAIL DATE

DELIVERY MODE

11/26/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/705,899

Applicant(s)

LEE ET AL.

Examiner

HOAN C. NGUYEN

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 24-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 24-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

Claims 2-23 are cancelled. Claims 1 and 24-32 are still pending.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1 and 24-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US6680769B1) in view of Sukenori et al. (US005943106A).

In regard to claim 1, Lee et al. disclose (Figs. 3G-J) a multi-domain liquid crystal display device comprising:

- first and second substrates 31/33;
- a liquid crystal layer between the first and second substrates;
- a plurality of data lines 3 for applying a data signal on the first substrate 10;
- a plurality of gate lines 1 for applying a gate signal, the gate lines crossing the data lines to define a plurality of pixel regions, wherein each pixel region has a multi-domain structure which includes a dielectric structure 53 or slit 51;  
a thin film transistor near each crossing of the gate lines and the data lines;
- a common electrode 17 on the second substrate;

- a pixel electrode 13 connected to a drain electrode of the thin film transistor in each pixel region; and
- an auxiliary electrode line 15 electrically connected to at least one of the common lines in each pixel region, the auxiliary electrode line and the multi-domain structure distorting an electric field applied between the common electrode and the pixel electrode to thereby form at least two domains in each pixel region during an operation of the multi-domain liquid crystal display,

wherein

- the auxiliary electrode line is formed between the pixel electrode and the data line at an outside of the pixel electrode in the pixel region and the auxiliary electrode is not overlapped with the data line.

Claim 24:

- the common electrode includes an opening area 51.

Claim 25:

- a dielectric structure 53 on the second substrate.

Claims 26-27:

- the liquid crystal layer has a negative or positive dielectric anisotropy.

Claim 28:

- the liquid crystal layer includes a chiral dopant.

Claims 29-31:

- a phase-differential film on at least one of the first and second substrates, wherein the phase-differential film includes a negative uniaxial film or the phase-differential film includes a negative biaxial film.

Claim 32:

- the auxiliary electrode line 15 is formed in the same layer as the gate lines.

However, Lee et al. (US6680769B1) fail to disclose the auxiliary electrode line electrically connected to at least one of the gate lines in each pixel region.

Sukenori et al. (US005943106A) teach the auxiliary electrode line electrically connected to at least one of the gate lines in each pixel region.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a multi-domain liquid crystal display device as Lee et al. disclosed with the auxiliary electrode line electrically connected to at least one of the gate lines in each pixel region for improving display characteristics due to gate line instantaneously applied with pulse voltage (col. 7 lines 15-22) as Sukenori et al. taught.

2. Claims 1, 25-27 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (US6356335B1) in view of Sukenori et al. (US5943106A).

In regard to claim 1, Kim et al. disclose (Figs. 5-11) a multi-domain liquid crystal display device comprising:

- first and second substrates 31/33;
- a liquid crystal layer between the first and second substrates;
- a plurality of data lines 3 for applying a data signal on the first substrate 10;
- a plurality of gate lines 1 for applying a gate signal, the gate lines crossing the data lines to define a plurality of pixel regions, wherein each pixel region has a multi-domain structure which includes a dielectric structure 53 or slit 51;  
a thin film transistor near each crossing of the gate lines and the data lines;
- a common electrode 17 on the second substrate;
- a pixel electrode 13 connected to a drain electrode of the thin film transistor in each pixel region; and
- an auxiliary electrode line 27 electrically connected to at least one of the common lines in each pixel region, the auxiliary electrode line and the multi-domain structure distorting an electric field applied between the common electrode and the pixel electrode to thereby form at least two domains in each pixel region during an operation of the multi-domain liquid crystal display,

wherein

- the auxiliary electrode line is formed between the pixel electrode and the data line at an outside of the pixel electrode in the pixel region and the auxiliary electrode is not overlapped with the data line.

Claim 25:

- a dielectric structure 57 on the second substrate.

Claims 26-27:

- the liquid crystal layer has a negative or positive dielectric anisotropy.

Claims 29-31:

- a phase-differential film on at least one of the first and second substrates,  
wherein the phase-differential film includes a negative uniaxial film or the phase-differential film includes a negative biaxial film.

Claim 32:

- the auxiliary electrode line 27 is formed in the same layer as the gate lines (col. 4 lines 49-50).

However, Kim et al. fail to disclose the auxiliary electrode line electrically connected to at least one of the gate lines in each pixel region.

Sukenori et al. teach the auxiliary electrode line electrically connected to at least one of the gate lines in each pixel region.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a multi-domain liquid crystal display device as Kim et al. disclosed with the auxiliary electrode line electrically connected to at least one of the gate lines in each pixel region for improving display characteristics due to gate line instantaneously applied with pulse voltage as Sukenori et al. taught.

3. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (US6356335B1) in view of Sukenori et al. (US5943106A) as applied to claims 1, 25-27 and 29-32 in further view of Takatori et al. (US6504592B1).

Kim et al. fail to disclose the common electrode including an opening area.

Takatori et al. teach the common electrode including an opening area.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a multi-domain liquid crystal display device as Kim et al. disclosed with the common electrode including an opening area for obtaining synergistic effect (col. 34 lines 1-3) as Takatori et al. taught.

4. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al. (US6356335B1) in view of Sukenori et al. (US5943106A) as applied to claims 1, 25-27 and 29-32 in further view of Shimada (US5710609A).

5. Kim et al. fail to disclose the liquid crystal layer including a chiral dopant.

Shimada teaches the liquid crystal layer including a chiral dopant.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a multi-domain liquid crystal display device as Kim et al. disclosed with the liquid crystal layer including a chiral dopant for adjusting the twist pitch (col. 4 lines 54-55) as Shimada taught.



***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (571) 272-2296. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HOAN C. NGUYEN  
Examiner  
Art Unit 2871

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ANDREW SCHECHTER  
PRIMARY EXAMINER